

and North Africa, is reported by McClatchie as abundant in California, and is said to be edible. It is grayish and very viscid. The same species is called poisonous by Bresadola, in his recent popular account of the edible and poisonous fungi of Middle Europe (*Funghi Mangerecci e Velenosi*, 1899).

Volvaria volvacea has been reported from a few other places in this country, but never in such abundance as in Lawrence. It is usually much smaller. It grows also in Europe and in Ceylon.

An interesting series of buttons, collected in Mr. Silsbee's locality, was shown to the writer by Mr. G. E. Morris. Even the smallest were very dark colored above — almost black — and with a velvety look. On the older ones, and on the ruptured volva, the color was less intense. There is little doubt that this species is edible, but caution is necessary.

Other species of *Volvaria* reported from this country are little known. One, *V. Loveiana*, found in Europe and in Canada (by J. Dearness, as reported by Lloyd) has a peculiar habitat — on decaying agarics (*Clitocybe*) and should accordingly be easily recognizable.

More information as to the occurrence of species of *Volvaria* in New England would be welcome. They may be easily preserved by drying.

CAMBRIDGE, MASSACHUSETTS.

MISCELLANEOUS NOTES ON NEW ENGLAND FERNS, — III.

GEORGE E. DAVENPORT.

(Presented to N. Eng. Bot. Club, Dec. 2, 1901.)

NOTE 5. SUBDIVISION OF THE NEW ENGLAND ASPIDIEAE. — In my last notes I explained my reasons for adopting *Athyrium* for *Asplenium filix-foemina* and now, as I intend adopting some generic changes in *Aspidium* it seems advisable to explain my reasons for doing so, and to preface my account of a most extraordinary fern by a synopsis of our New England *Aspidieae*.

The genus *Aspidium* as recognized by Prof. Daniel Cady Eaton in

his superb work on the Ferns of North America, and, as until recently, generally adopted in the United States, comprises all of the shield ferns with orbicular indusia centrally attached to the receptacle (peltate), and those also with cordate reniform indusia attached at the sinus, without regard to the character of the venation except in so far as it may serve the purposes of sectional relations.

As originally proposed by Olaf Swartz in 1800 or 1801 (Schrader's Journal), and more fully established by him in his Synopsis Filicum later on (1806), the genus consisted of a heterogeneous collection of species having little cohesion from natural affinities, but representing the best arrangement which had been made up to that time.

Subsequent revisions, fortified by the views of such eminent pteridologists as Drs. Presl, Mettenius and Hooker, gradually reduced its proportions to the limitations recognized by Prof. Eaton.

The genus as thus constituted has consisted of three well characterized types, which, while closely related, are readily separable into distinct entities.

The first of these types is represented by *Aspidium trifoliatum* Swartz, which stands as the type of *Aspidium* proper, and which is a species with orbicular, peltate indusia, and anastomose venation.

The second type is represented by *Aspidium Lonchitis* Swartz, which, while it has peltate indusia, as in *Aspidium* proper, has its venation wholly free. Not only this but it possesses additional characters of such a nature that many able authorities have treated it as generically distinct in every way from *Aspidium*. Now it was upon this species that Roth founded his genus *Polystichum* somewhere between 1798 and 1800 (exact date uncertain, but the same as that at which he established *Athyrium*; see previous note in RHODORA, ii. 267), and *Polystichum Lonchitis* Roth, with its peltate indusia, free venation, and special characters to be described, stands as the type for Roth's genus.

In considering the history of the early genera it appears that nearly, if not all of them consisted of a heterogeneous medley of species which are now seen to have represented different genera, and this justifies adopting the first correctly named species under the genus as the generic type; only such other species as conform to such type characters being accepted as rightfully belonging to the genus.

Following out this principle we find our third type in those members of the *Aspidium* genera with a cordate reniform indusium

affixed to the receptacle by a well defined sinus. Here we have by far the largest group of Aspidiums and our New England species exactly represent true *Nephrodium* as proposed by Richard in Michaux's Flora Bor.-Am. ii. 1803, the type being *Nephrodium marginale*. It is true that Richard named two other species in their order first, but as both belonged to other genera already established they naturally lapsed in favor of *N. marginale* which thus became the type species. As this species is characterized by having cordate-reniform indusia and *free veins*, it is clear that species with united veins cannot properly be considered as belonging to Richard's genus by anyone attaching importance to the system of venation; yet many authors have persisted in treating *Nephrodium* as if it had been founded on species with united veins.

The genus, even as here recognized, is made up of two well characterized sections, one consisting of the *marginale* and *spinulosum* group with evergreen, or nearly evergreen fronds, fascicled stout rootstocks forming crowns, and with several roundish fibro-vascular bundles in the stipe; and the other with softly herbaceous fronds, long slender creeping rootstocks, and two flattish bundles in the stipe.

This whole matter is discussed more fully in my Fern MSS. where I have made the characters last mentioned the basis for a divisional arrangement of our New England Ferns.

The following brief synopsis will show the arrangement adopted here for our New England Aspidiums:—

TRIBE ASPIDIEAE — J. Smith. *Sporophyte* (plant-body) large, with fascicled rootstocks forming crowns, or creeping rhizomes; fronds variously compounded, evergreen or herbaceous; *sporophylls* (fruit-bearers) with the sori covered by peltate (attached at the centre), or cordate-reniform indusia, the latter being attached at the sinus; venation free or anastomose.

I. ASPIDIUM (from ἀσπίς — meaning buckler or shield) Swartz, as emended. — Sori orbicular, indusium peltate, veins anastomose. Not represented in New England.

II. POLYSTICHUM (from πολὺς — many, στίχος — order) ROTH. — Sori orbicular, indusium peltate, veins free. The members of this genus are further distinguished by the irregular auricled pinnae, coriaceous texture and spiny toothed lobes. The genus is represented in New England by two ferns:

1. *Polystichum acrostichoides* Schott, Christmas Fern, and
2. *Polystichum aculeatum* Roth, var. **Braunii** (Spenner), n. comb. (*Aspidium Braunii* Spenner.) I am not sure that those who maintain specific rank for this fern are not correct, but prefer for the present to adhere to Prof. Eaton's treatment.

III. NEPHRODIUM (from νεφρός — kidney, with reference to the form of the indusium) Richard.¹ — Indusium kidney-shaped, or cordate-reniform with a sinus attachment. The genus is well represented in New England by two distinct sections, as follows: —

Section 1. *Evergreen*, or partially so; the sporophylls generally withering in late autumn; rootstocks caudiciform, forming crowns; fibro-vascular bundles 3 to 7 roundish. The section embraces the following species: —

N. marginale Richard, *N. cristatum* × *marginale* Davenport, *N. cristatum* Richard, *N. Goldieanum* Hooker, *N. Boottii* Davenport acc. to Gilbert, *N. spinulosum* Desvaux, and *N. fragrans* Richardson.

Section 2. *Herbaceous*; fronds withering early, rootstocks rhizomatose, wide creeping; fibro vascular bundles flattish, two in number. Contains the following species: — *N. Thelypteris* Desvaux, *N. Novboracense* Desvaux, *N. simulatum* Davenport.

A fern now to be described will become a member of the First Section, as will some other forms to be described later on.

In the arrangement which I have here presented, and which it is my intention to adopt in practice, I have not taken into account Bory's *Lastrea*, as being apparently founded on a misapprehension of the true character of *Nephrodium* it can only properly be regarded as a synonym; neither have I taken into account Adanson's *Dryopteris*, which the Rochester advocates are striving so hard to establish, because a genus so ill defined, with its type standing for one thing and its description for another, has no just claim for consideration as against the more clearly defined *Nephrodium* which has been in use for nearly a century.

NOTE 6. AN ANOMALOUS FERN. — Late in the autumn of 1894 (Nov. 4) I found growing in one of the woodland swamps in Medford, near plants of *Nephrodium marginale*, *cristatum* × *marginale*, *cristatum*, *Clintonianum* and *spinulosum*, a strange fern which I could not satis-

¹ Richard's name does not appear in Michaux and for that reason some authors cite Michaux as authority for the names used therein, but Richard has been generally recognized as the real author.

factorily determine. The plant stood about two feet high, with the erect fertile fronds standing well above the sterile, and its whole aspect resembling that of an abnormal form of *Clintonianum*.

On examining the rootstock I found it to be sub-erect, with a growth similar to that in *N. marginale*, but sufficiently distinct from that of *N. cristatum* \times *marginale* to suggest its being a probable hybrid between *marginale* and *Clintonianum*.

As the particular section of woodland where it grew had been staked out, and the plant appeared to be in danger of an early extermination, I transplanted it to my own grounds where I could watch and study it.

This I have done since, until the plant with a single crown has become a large clump, with a breadth of something like twelve inches and a length of eighteen or twenty; and with sixteen crowns, on one of which last spring I counted 22 crosiers.

Notwithstanding the fact that this extension had occurred by means of lateral growth, the original crown has maintained its sub-erect position, while the later crowns which have developed from lateral offshoots have assumed in one direction more the character of *Clintonianum* with a distinctly lateral or rhizomatose growth, and in the other direction the caudiciform character of the original crown; so that there has existed on the same plant crowns of two types, viz.: that of *N. marginale* and that of *Clintonianum*.

Not only that, but the fronds from the different crowns have shown all manner of variations that might serve as instructive object lessons for some of our industrious species and variety makers.

The behavior of the plant during successive seasons has been noticeable from the fact that some years it would produce a large percentage of perfect fronds, and in others a large proportion of abortive ones, while none have ever reached the original height of the plant.

It has also been noticeable that the position of the sori varied on different fronds from different crowns. Thus on fronds growing on the lateral ends of the clump the sori are medial, as in normal *Clintonianum*, or sub-marginal as would be the case in a hybrid between *marginale* and *Clintonianum*, while on fronds from the original crown, and the later sub-erect crowns, and sometimes on the same frond, a mixture of medial and costal sori occurs, and on those from the latest sub-erect crowns a costal series of sori generally prevails.

The character of the fibro-vascular bundles is the same as in all members of the group to which this plant belongs.

I doubt if it is possible to formulate any absolute rule for determining the different species and varieties of the evergreen shield ferns from the character of the vascular bundles,—certainly not from their number, which is regulated by the size of the frond and the stoutness of the stipe. Thus in large fronds of the different species the number may be seven, and in small fronds five, or even three, at the base of the stipe, with corresponding reductions above.

Our plant is no exception to this rule, but it has shown such remarkable variations from all other forms of the group that it seems worthy of special notice.

Several seasons' observations have left me as much in the dark as to its origin as at first.

That it is a hybrid I believe, but between what ferns it is impossible to say. *Marginale* characters appear in the sub-erect crowns, and in the sometimes nearly marginal elevated coriaceous sori; *Clintonianum* characters in the decumbent lateral crown and medial sori; *Spinulosum* characters in the sometimes deltoid lower pinnae, elongated pinnules, and sharply, almost spinulosely toothed lobes.

As just such another plant may never be found again it does not seem worth while to dignify this one with a name, but in case another should be found the following diagnosis may assist in determining it more clearly.

Mature sporophyte large (12 to 24, or more inches tall), partially evergreen, sterile fronds persistent, sporophylls gradually withering away; rootstock decumbent, fasciculate, original crown sub-erect increasing laterally, at length forming large composite clumps, with sub-erect, decumbent or lateral, crowns all connected by short, stout rhizomes, combining types of *marginale* and *Clintonianum*; crosiers densely clothed with a mixture of large ovate and narrowly lanceolate pale brown scales. Stipes usually 4 to 8 inches long, sometimes longer, and, as well as the primary rachis, stramineous, often darker below, deeply channelled along the face, clothed at the base, and well above, with the ascending scales from the crosiers, and chaffy along the upper rachises. Laminae 12 to 18 inches, or more, in length, 4 to 10 inches broad in the middle, narrowing both ways, often abruptly so at the acuminate apex, which then resembles that of *N. marginale*; once or twice pinnate, or thrice pinnatifid; the middle pinnae

on perfect fronds long lanceolate, acuminate, the lower pinnae shorter often deltoid with acute apices, the upper series narrowing abruptly or gradually to an acute or acuminate apex; superior pinnules generally the longest but the order sometimes reversed; lobes more or less deeply toothed and partially spinulose, texture sub-coriaceous, surfaces smooth; venation, and fibro-vascular bundles as in other members of this group. Sori medial, costal or sub-marginal.

Abnormal fronds defy description, and as it is impossible to get a clear conception of the unique character of this fern from single fronds, a series of the most characteristic will be photographed for distribution.

MEDFORD, MASSACHUSETTS.

REDISCOVERY OF *PHASEOLUS PERENNIS* IN NEW ENGLAND. — In preparing his check-list of the Leguminosae of New England, Hon. J. R. Churchill took much pains to investigate the various reports as to the occurrence of *Phaseolus perennis*, Walt., in New England.

He has published the result of his work with some detail in RHODORA, II : 92 — April, 1900. He states that the only known specimens from New England were collected nearly fifty years ago at or near New Haven, Connecticut, and as he could find no specimens collected in more recent years, nor any botanist who had seen it, he would infer that it had disappeared from our flora. It is therefore a pleasure to place this *Phaseolus* in good standing again among our New England plants, and record for it a present and well established station.

I secured specimens of it at Norwalk, Connecticut, the past summer, in flower on August 23rd, and in good fruit September 16th. This station is about thirty five miles from New Haven, so it can hardly be the one from which the specimens referred to by Judge Churchill were taken. The Norwalk station is in a patch of rocky woodland, and only a few rods from the border of a salt marsh. The growth was strong and healthy, the vines trailing over the ground and forming a thick mat covering about a square rod, to the exclusion of most other plants. — C. H. BISSELL, Southington, Connecticut.

SOME PLANTS RECENTLY FOUND IN AND AROUND NORTH EASTON, MASSACHUSETTS. — *Solanum carolinense*, L. (Horsenettle.) This western species of *Solanum* was found in a dry location in the town of